

possibly can be, to ram it the better and the more equal, and must be of solid hard stuff with no concavities daubed over with store of mortar," and he adds here in a marginal note that these precautions were observed in building the foundations of Solomon's temple, but he does not give us his authority for this information.

The clerk of works is further to see that the line and plumb rule be often used; that the bricklayers make small scaffolding holes, and never suffer them to begin scaffolding in the morning, but before leaving of their work; "for if in the morning, he says, "most of them will make it a day for the gathering of nuts."

Then follow some injunctions respecting mortar, that I scarcely need particularise—and the author proceeds to the subject of masonry. The workmen must observe exactly the surveyor's molds, and work close and neat joints, using but little mortar between them, not only because much mortar will be washed away, but that cornishes will also appear like a rank of open teeth; and they must not forget to shure up the middle part of the head of the windows, as well as the sides, to prevent an unequal settling of the work, and, consequently, cracks. There here ensue, for the next thirteen pages, detailed directions for the proportioning of the several orders. The masons "must divide the Tuscan column, or rustick base and capital (which is as much as to say, feet and head) seven times its thickness; the architrave, freeze, and cornish one-fourth part of the column, with base and capital. If they make the said order without a pedestal, they must divide its whole height into seventeen parts and a half, which (in their vocation phrase) are called *moduli*, and are divided into twelve equal parts: if they are directed by their surveyor to make them with a pedestal, then are they to divide the whole height into twenty-two and one-sixth part, for that the perfect shape of the said order requires a pedestal which must have a third part of the column. It seldom happens that a pedestal is put to the Tuscan order, because (as it represents an atlas, and that no man will take a dwarf to reach to the first story of a building) the said order requires, not to be set as a candlestick on a cubbert; it's as a substantive, that can stand without an adjective." And then our author adds, for he loves a joke, whether in season or out of season, "some Venetian ladies must have their shoppings to stand on, and were they as strong as the Tuscan, they would not need some of their *Masars* to lean upon," which no doubt conveyed a hard hit at the luxurious habits of the Venetians, then in the plenitude of their wealth and greatness, but which has lost its point now—the very terms used being obsolete.

The author then proceeds to lay down the proportions of the Doric, Ionic, Corinthian, and Composite orders: the necessity for adhering exactly to these proportions he considers paramount—"For it is a rule as certain," he says, "as that without the same, there cannot be a perfect building made, no more than a man could without good orthographic write true English."

"It is the rule of the ancient masters, whose reliques, to be seen throughout most places of Italy, make many strangers that come their gaze so wide as that they need no gaze."

The author now enters upon the subject of carpentry. He teaches "That the carpenters should be good husbands in the management of the builder his timber; on the cutting of the scantlings; their sparing to make double mortices which do but weaken the summers. To lay no girders which are needless and hinder some to the boarding of a room; no summers to be laid except the ends of them are either pitch, or laid in loam to preserve them from rotting," "and therefore in Italy, France, and Germany, and among the most prudent and solid builders, the free masons, put stone car-touches in the top of the inside walls which are bearers to the summers, as such cartouches are seen in divers churches, and some of them are carved in ornamental figures." He alludes, no doubt, here to the stone corbels upon which we sometimes see the ends of principal timbers resting: an excellent old practice which we in our own days follow, although in a much less picturesque way, by inserting the ends of our timbers into cast-iron shoes pro-

jecting from the face of the wall. The utilitarian tendencies of modern practice have been very subversive of the old picturesque ways of our ancestors, whether on costume, furniture, or architecture. An upholsterer now ascertains with precision the size of the piece of oak that will just carry his table; he seeks till he finds the safe minimum scantling, and this successful discovery is the triumph of his art. Whilst our forefathers would take a log of oak, all regardless of this politico-economical search after the greatest possible strength with the least possible stuff, and would carve it into one of those ponderous and fantastic legs which charm us by their quaintness, although they defy our efforts to lift them.

In further illustration compare the broad, deep, capacious fire-places, whereby our forefathers would warm themselves, with the scientifically constructed, snug, rumbordised stove, with bevelled cheeks, no hobs, contracted openings, all contrivances admirably adapted to meet our modern requirements of convenience and economy; but how destructive to the poetry of our grandfathers' ruder arrangements!—men of a rough, bold stamp, who, provided they secured to themselves a warm chimney corner, appeared to regard with great indifference the minor evils of smoke and blacks.

Then follow many other details of the manner the carpenter is to lay his timber, and the author adds that the clerk of the works must be very careful not to suffer the carpenters to lay any timbers under the chimneys, "whereby many houses have been set on fire, and burnt to the ground." We have then a variety of scantlings for the timbers of floors and roofs, which scantlings he gives as fit for substantial structures, but which are "not usual in lime and hair bird-cage-like buildings"—a remark that leads us to the conclusion that the flimsy structure of modern speculators was not wholly unknown to our ancestors. The care of the clerk of the works must also be on "materials of weight, as sauder, wherewith an unconscionable plumber can ingross his bill." In this respect we see that 200 years' experience has not advanced us—we have still "unconscionable plumbers." "The clerk is to see sauder weighed and well managed; and in the attesting of bills have a care not to pass his eyes slightly over them, lest when a plumber sets pounds of candles used about his sauder, that trick prove as insupportable as that of one who, having played away a round sum of his master's stock in a journey to the East Indies, set down in his bill to have paid a hundred pound for mustard." "He must likewise have a clear insight on the glass pains of the glazier; suffer no green pains of glass to be mixt with the white. He must with his eyes follow the measurer of the work, his rod or pole; so the line wherewith the joiner's work is measured, that it be not let slide through the measurer's fingers, since the joiner's work hath many goings in and out, and a leger-de-mayne may be prejudicial to the paymaster's purse. It were likewise better to agree with painters to have their work rated on running measure and on the straight, as the carpenter's work, who (being of an honest Joseph's profession), are as deserving to be well paid as the painters who do but spend the sweat of wall nuts (to wit, oyle), the carpenters that of their browes."

"As for coverings of buildings, lead is best for churches, for who would rob them but goths and vandals? Blue slates are most comely for a nobleman's palace," "a roof covered with them is of an equal color, when as red tiled roofs the least breaking of them makes great chargeable work for the tiler, who often removes ten tiles to lay two new ones in their place, and renders the nobleman's roof like a beggar's coat."

Our author then proceeds to some remarks on the making of bricks, and recommends the clerk of works to look well to the working of the clay, which, if not well wrought, will never make good bricks. He says, that it is usual to pay 5s. per thousand for making and burning bricks, the clay-digging therein comprehended. He then goes into some details as to the relative expense of making bricks, and purchasing them made; whereby it appears that only 6s. 8d. are saved in 20,000 bricks, by making them. He says, that of clam-burnt bricks, 500 out of 20,000 are unfit for work.

Various other details are entered into re-

specting the making and use of bricks. Men dig clay, he says, for 6d. the thousand; lime is burnt at 4s. per load, and costs 40s. a load. Touching the use of chalk in building walls, he says, that "those that mend the making use of chalk in their walls must be contented (if the ground hath springs) with the green mold which breaks thro' the whitened walls within doors. Walls about a park or court may be fited with chalk, which may be digged for 18s. per load, and brought for 2s. 6d. the load." "Good country bricklayers do work at 27s. the rod, the bricks not being rubbed. Good London bricklayers will work the rod for 40s. with rubbed bricks; the inside for 33s., arches comprized."

Then follow some remarks about lime burning, describing the mode of burning it "in China and other parts of the Indies," wholly with wood and not in kilns.

Our author now proceeds to a new division of his work, which he heads, "As for choice of master workmen." "King Henry the Eighth," he says, "shewed a good president when the serjeant plumber, calling his workmen to cante, in his presence, a leaden medal which was given him: the king told him, 'he would have no walking master-workmen.' Those, therefore, which are fit to be employed are working masters, and not those who walk from one building to another; 'nor will any master workman deny to have had as much more done and well, by bestirring their hands and tools in their workmen's presence than otherwise.'" I cannot refrain here from calling your attention to the singular social change that has taken place since King Henry inflicted his reprimand on the walking instead of the working master. Fertile as he is said to have been in oaths, certainly no usual oath would have sufficed to express the royal indignation had he lived in these times, to have seen the master workmen not walk, but drive up to his works in as fair an equipage as that of any of his most favoured courtiers. Our author proceeds to counsel that master workmen be bound to a precise time, and to observe exactly the model held forth to them by the chosen surveyor, and to make good at their own cost what they do amiss. He further counsels "to shun the reprehending a master workman of any oversight before his men; but rather privately; since it would be to him as prejudicial as a check to a commander at the head of his troops."

We have next a division of the work entitled "As for the Builder and Proprietor." He advises the builder (by which term he always means the employer) to buy his own materials, and to have in reserve such a stock of his own as he can well spare, and also, he adds, "against the mistakes of workmen, a stock of patience;" nor to begin building walls before March, nor after the middle of September.

The next twenty-eight pages contain a variety of miscellaneous and not very well assorted notes respecting the prices of materials and workmanship.

Touching the paving of courts, to prevent the overgrowing of grass and the charge of too often weeding, he says, "it would not be amies to lay chalk or lime under the paving, and to do the same in gardens under gravel walks"—a piece of advice which is well worthy of notice.

With respect to street paving with pebble stones, he alludes to a Mons. Le Cœur having recently introduced great improvements in paving works done under the commissioners. This French undertaker appears to have formed a company for carrying out a new invention in paving, "whereby they are not only able to make a most substantial good pavement, but are likewise capable by that same new invention to maintain it durable for twenty-one years." Our author (who, as must have been observed, is remarkable for the want of order and method in his remarks), brings his book to a close with some, what he calls necessary notes. "What contributes more to the fatal end of many good mother's son is ill-building: paper-like walls: cobweb-like windows: doors made fast as with packthread, purposely made to tempt men who, through extreme want, are become weary of a languishing life, and to whose fatal end, ill builders are in a manner accessory." He says that the scarcity of thieves vaunted of by the Hollanders, Germans, and other northern nations, is to be attributed